

Work Order ID 61730

Tuesday, August 31, 2010 3:08:17 PM



Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Item Name: Replacement Skidtube

Stop



Start Date: 8/31/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 9/13/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: *RP* Date: 10-8-31 Tooling: Date:
QC: Date: SPC (Y/N): Date:

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D2580	Rev D								

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

N/A *[Signature]*

110

0.00



BENDING MACHINE - SKIDTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

[Signature] 10-9-27

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

120

0.00



Skidtubes

0.00

Skidtubes

Memo

1- Deburr ends

2- C'sink holes as per dwg without cutting fluid

3- Prepare tube for welding, remove alodine as required.

Am 10-09-270

130

QC5- Inspect part completeness to step on W/O

0.00



QC

0.00

Quality Control

Memo

1 - BE 10/09/30

W/O:		WORK ORDER CHANGES					
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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Weld step D2576 as per Dwg. D2580 and QSI 004.
A/R□□□ Aluminum Rod

M114877 / M115778

BE 10/09/30

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill
A/R□□□ Aluminum Rod

M114877 / M115778

BE 10/09/30

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64",
adjust stopper not to hit web. Deburr5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580.
Deburr holes

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Deburr

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

BE 10/10/04

W/O:		WORK ORDER CHANGES					
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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 QC Quality Control	QC10- Inspect visual per QSI004- ground welds Memo	0.00 0.00							
			8/10/10/04						
160 QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00							
			8/10/10/04						
			BR 10-10-6						
170 HandFinish Hand Finishing	Pressure Wash per QSI005 4.3 Memo Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.	0.00 0.00							
			BR 10-10-6						

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Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180



Powdercoat

Powder Coating

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00 BK10-10-6

M115291

Memo

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

11:30
320°
12:00

0.00

①

190



QC

Quality Control

QC3- Inspect Part Finish

0.00

=> JH 10/10/06

Memo

0.00

1 0

Dart Aerospace Ltd

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Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

200

0.00



HandFinish

Memo

0.00

Hand Finishing

= 22 10/10/06

1 0

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

✓ A/R ☐ ☐ Sikaflex-291 M11511 ☐ ☐
Sikaflex expire date: 1110

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

✓ 4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive
A/R ☐ ☐ Sikaflex-291 M11511 ☐ ☐
Sikaflex expire date: 1110

✓ 5-Wing Walk as per Dwg D2580 and QSI 005 4.4
Batch: M115028

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

210



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

51010107



220



Packaging

Packaging

Packaging

0.00

Memo

0.00

Identify and pack for shipping as per PPPD205-634-041

Location:

PPP Rev: _____

PPP

4, 300 (10/10/10)

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

10/10/08

MF

10-10-08

Dart Aerospace Ltd

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Parent Item Name: Replacement Skidtube

Start Date: 8/31/2010

Required Date: 9/13/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ
 IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD
 IPP Rev. O 06.02.28 Added paperwork EC
 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D2580-1

Manufactured

No

110

Each

7.0000

1

1



205 Skidtube bent detail

Location

Loc Qty

Loc Code

LG

B62047

6

57028

1

60953

2

60956

1

61191

2

ST046

1

59856

1

① DP 10-9-22

D2576-3

Manufactured

No

140

Each

78.0000

1

1



Step (maching detail)

Location

Loc Qty

Loc Code

LG

78

46661

30

52215

48

1 BE 10-09-30

W/O:		WORK ORDER CHANGES					
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Start Date: 8/31/2010

Required Date: 9/13/2010

Start Qty: 1.00

Required Qty: 1.00

D2579 Manufactured No 140 Each 344.0000 20 20



Crossbolt Spacer

Location Loc Qty Loc Code

LG	344	
57052	5	
57348	4	
58433	2	
59113	62	
60845	102	
61199	169	

D2855 Manufactured No 200 Each 74.0000 1 1



Cap

Location Loc Qty Loc Code

FP6	1	
56613	1	
ST026	73	
50513	1	
50770	28	
51539	2	
53791	42	

AN3-5A Purchased No 200 Each 1,522.000 2 2



Bolt

Location Loc Qty Loc Code

ST350	1522	
105057	522	
115016	500	
115371	500	

20 BE 10/09/30

10/10/06

XL

10/10/06

XL

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Parent Item Name: Replacement Skidtube

Start Date: 8/31/2010

Required Date: 9/13/2010

Start Qty: 1.00

Required Qty: 1.00

AN960JD10L NAS1149D0332J Purchased

No

200

Each

2,471.000

2

2



Washer



10/10/06

Location

Loc Qty

Loc Code

ST348

2471

110985

2471

ALS7-1032-130

Purchased

No

200

Each

1,378.000

50

50



Insert



10/10/06

Location

Loc Qty

Loc Code

FP

861

115079

861

ST282

517

113238

17

115502

500

AN3C4A

Purchased

No

200

Each

1,513.000

50

50



BOLT



10/10/06

Location

Loc Qty

Loc Code

ST303

452

115438

452

ST350

1061

114108

14

114416

12

114523

2

114941

33

115300

1000

X50

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Start Date: 8/31/2010

Required Date: 9/13/2010

Start Qty: 1.00

Required Qty: 1.00

AN960C10L NAS1149C0332 Purchased No

200 Each 155.0000 50 50



washer



10/10/06

Location

Loc Qty

Loc Code

ST245

155

107534

29

M115816

x50

109545

54

111548

72

D3566-13 Manufactured No

200 Each 22.0000 1



Gasket



1

10/10/06

Location

Loc Qty

Loc Code

FP012

22

59661

14

x1

60209

8

D3566-5 Manufactured No

200 Each 25.0000 1



Gasket



1

10/10/06

Location

Loc Qty

Loc Code

FP

22

60869

22

x1

FP015

3

59158

3

D3566-1 Manufactured No

200 Each 18.0000 2



Gasket



2

10/10/06

Location

Loc Qty

Loc Code

FP015

18

B61492

x2

57715

2

60202

10

61215

6

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Required Date: 9/13/2010



Start Qty: 1.00

Required Qty: 1.00

D3564-11	Manufactured	No	200	Each	14.0000	1	1
							<u>YI 10/10/06</u>
Wearshoe							



<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP019	14	
59941	1	
<u>60302</u>	13	

D3564-13	Manufactured	No	200	Each	19.0000	1	1
							<u>YI 10/10/06</u>
Wearshoe							

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP17	19	
59660	7	
<u>60862</u>	12	

D3564-9	Manufactured	No	200	Each	17.0000	1	1
							<u>YI 10/10/06</u>
Wearshoe							

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP	1	
55334	1	
FP019	16	
59201	3	
<u>60236</u>	13	

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Start Qty: 1.00

Required Qty: 1.00

D3564-5

Manufactured No

200

Each

16.0000

1



Wearshoe



1
10/10/06

Location

Loc Qty

Loc Code

FG

1

34806

1

FP19

2

57525

1

58709

1

FP-19

13

59157

2

60868

11

D2594-3

Manufactured No

200

Each

187.0000

16



O-Ring, 205 Skidtube



16
10/10/06

Location

Loc Qty

Loc Code

FP

187

55546

19

58191

12

59358

156

VS 61762

X16

D2594-1

Manufactured No

200

Each

307.0000

16



Plug, 205 Skidtube



16
10/10/06

Location

Loc Qty

Loc Code

FP

183

42807

112

55002

71

FP14

124

58434

15

59110

109

B61932

X16

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DART

DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

RELEASED
07-06-28 *[Signature]*

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

SHOP COPY
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UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 61730
*Pro-8-3***GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

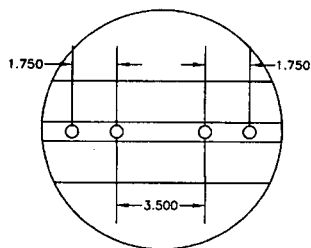
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

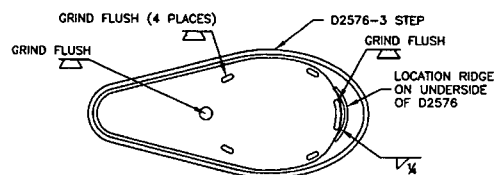
NOTE: Date & initial all entries

W/O 41730

DETAIL A
SCALE 5:24

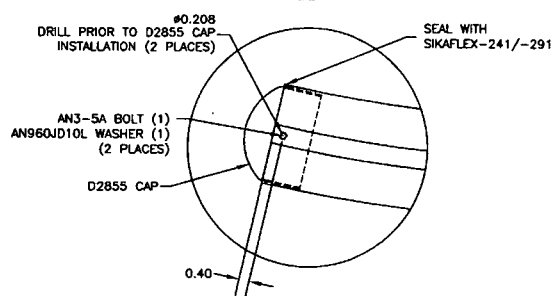


DETAIL B
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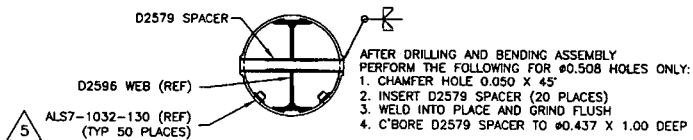


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07-06-28-4

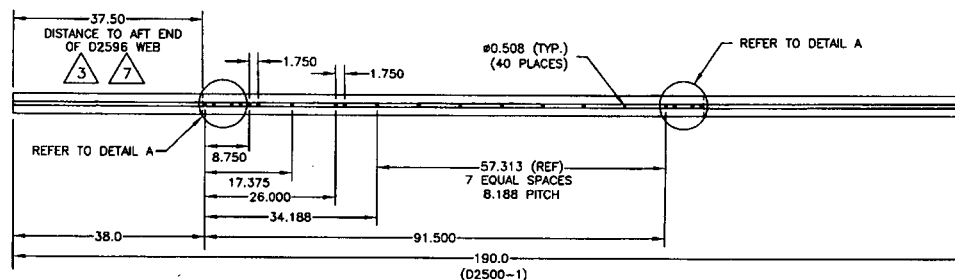
DETAIL C
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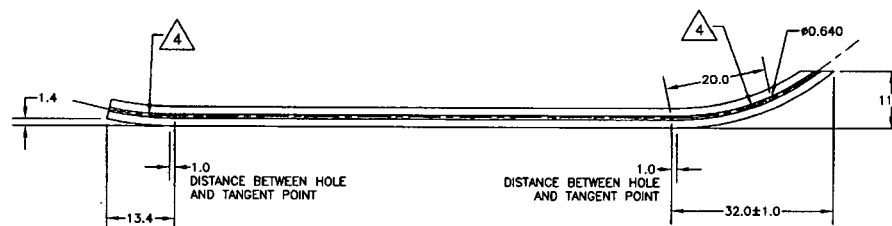
SECTION D-D
SCALE 5:24



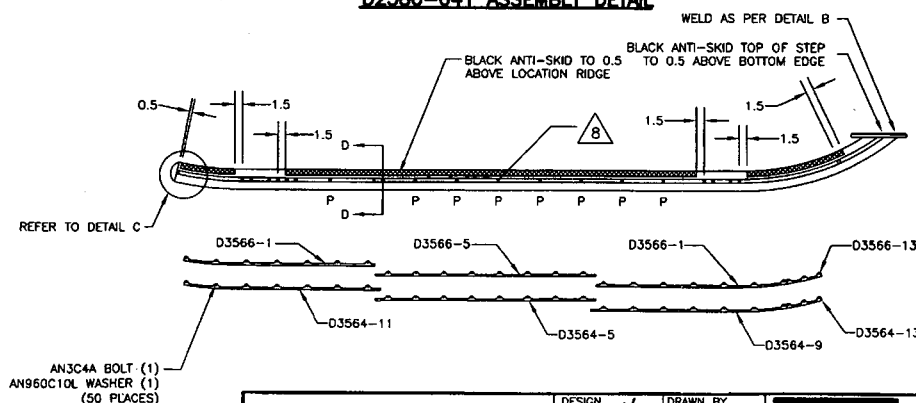
D2580-1 DRILLING DETAIL



D2580-1 BENDING AND CUTTING DETAIL



D2580-041 ASSEMBLY DETAIL



D2580-041 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

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DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HAMMERSBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO.	REV. 0
DATE		D2580	SHEET 2 OF 3
07.02.27		TITLE	SCALE
		205 SKIDTUBE ASSEMBLY	1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

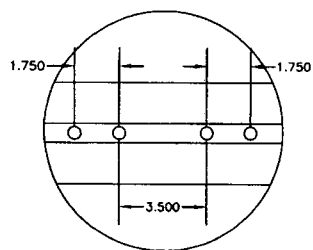
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

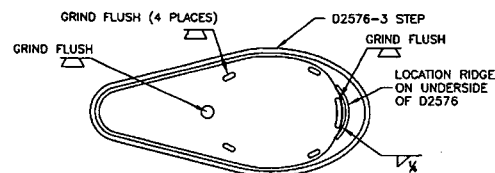
NOTE: Date & initial all entries

DETAIL E
SCALE 5:24

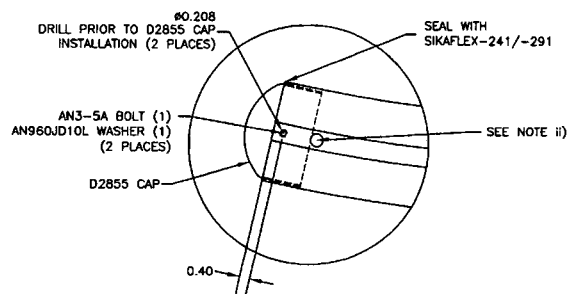


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07 Dec 28

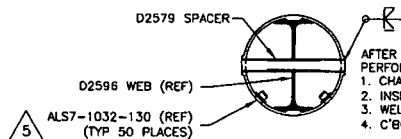
DETAIL F
SCALE 5:24



DETAIL G
SCALE 5:24



SECTION H-H
SCALE 5:24

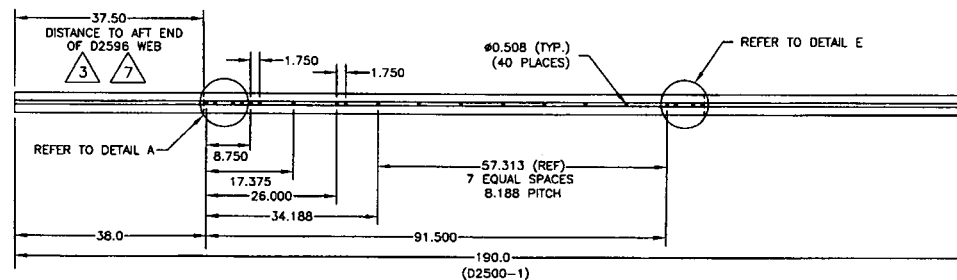


- AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:
1. CHAMFER HOLE 0.050 X 45°
 2. INSERT D2579 SPACER (20 PLACES)
 3. WELD INTO PLACE AND GRIND FLUSH
 4. C'BORE D2579 SPACER TO $\phi 0.437$ X 1.00 DEEP

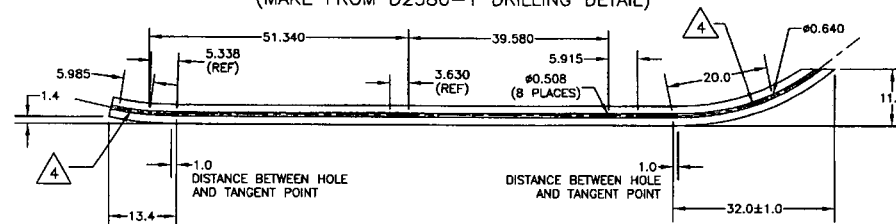
D2580-045 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE
WITH THE SPACER AT THIS LOCATION

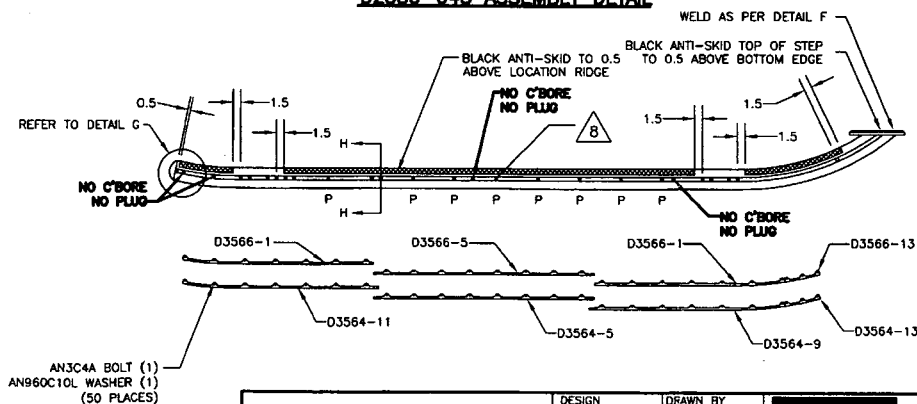
D2580-1 DRILLING DETAIL



D2580-5 BENDING AND CUTTING DETAIL
(MAKE FROM D2580-1 DRILLING DETAIL)



D2580-045 ASSEMBLY DETAIL



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P.4

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DATE
07.02.27

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TITLE	205 SKIDTUP
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DART AEROSPACE LTD.
HAMPSHIRE, ONTARIO, CANADA

REY

SHEET 3 OF 4

ASSEMBLY

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 238

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: 61352
Part number: D205-634-041
Description: 205 skid tube
Welding Process: Tig[☒] Mig[]
Base material: Aluminum
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier Paul Dahl Date of Test Coupon 10.08.25
Welder Barclay Elliott Date of Test Coupon 10.09.25

The above named individual is qualified in accordance with AWS D17.1.2001 to weld